

WHAT IS CLAIMED IS:

1. A cross dichroic prism for color decomposition, the cross dichroic prism being mounted with a reflection type liquid crystal projector for making a luminous flux from a light source obliquely incident on a reflection type liquid crystal display device, the cross dichroic prism transmitting a green color light component therethrough and reflecting blue and red color light components into directions different from each other upstream of the reflection type liquid crystal display device;

the cross dichroic prism comprising a blue-reflecting dichroic film for reflecting the blue light component and a red-reflecting dichroic film for reflecting the red light component, each of the blue- and red-reflecting dichroic films comprising lower and higher refractive index materials alternately laminated on a prism base;

the cross dichroic prism satisfying the following conditional expressions (1) or (2):

$$1.105 \leq N_h/N_l \leq 1.450 \text{ if } N_g \leq N_l \quad (1), \text{ or}$$

$$1.118 \leq N_h/N_l \leq 1.150 \text{ if } N_g > N_l \quad (2)$$

where N_g is the refractive index of the prism base, N_h is the refractive index of the higher refractive index material, and N_l is the refractive index of the lower refractive index material.

2. A cross dichroic prism according to claim 1, wherein the cross dichroic prism satisfies the conditional expression (1); wherein the higher refractive index material is a material selected from the group consisting of Nb_2O_5 , TiO_2 , Ta_2O_5 , LaTiO_3 , HfO_2 , ZrO_2 , and $\text{La}_{2x}\text{Al}_{2y}\text{O}_{3(x+y)}$; and wherein the lower refractive index material is a material selected from the group consisting of LaTiO_3 , HfO_2 , ZrO_2 , $\text{La}_{2x}\text{Al}_{2y}\text{O}_{3(x+y)}$, Y_2O_3 , PrAlO_3 , and Al_2O_3 .

3. A cross dichroic prism according to claim 2, wherein the prism base is a glass material made of BK7.

4. A cross dichroic prism according to claim 1, wherein the cross

dichroic prism satisfies the conditional expression (2); wherein the higher refractive index material is Al_2O_3 ; and wherein the lower refractive index material is SiO_2 .

5. A cross dichroic prism according to claim 4, wherein the prism base is a glass material made of BK7.

6. A cross dichroic prism according to claim 1, wherein the blue-reflecting dichroic film is constituted by 23 to 29 layers; and wherein the red-reflecting dichroic film is constituted by 19 to 25 layers.

7. A cross dichroic prism according to claim 1, wherein, in the blue- and red-reflecting dichroic films, at least one of lowermost and uppermost layers is a layer made of the lower refractive index material.

8. A cross dichroic prism according to claim 7, wherein at least one of the blue- and red-reflecting dichroic films is constituted by an odd number of layers.

9. A reflection type liquid crystal projector comprising the cross dichroic prism according to claim 1, wherein the luminous flux from the light source is incident on an entrance surface of the cross dichroic prism at an angle making the luminous flux oblique to an axis of the cross dichroic prism.